AMENDMENTS TO THE CLAIMS:

Claim 1 (Currently amended): A microfluidic system, comprising:

a substrate;

a fluid network disposed on the substrate for transporting fluids, said fluid network comprising a first segment and a second segment in fluid communication; and

an electrical source coupled across the first segment of the fluid network to apply an electric potential to induce electroosmotic flow in the first segment~~connection means for application of an electric potential across a first segment of the fluid network such that electroosmotic flow is induced in that segment;~~

a ~~coupling means for~~ coupler directing electric potential from the electrical source to the first segment and directing flow between ~~isolating electrical fields from a second segment of the fluid network while providing fluid communication between~~ the first segment and second ~~segements~~ segment of the fluid network to cause a flow in the second segment in the presence of electroosmotic flow in the first segment.

Claim 2 (Original): A microfluidic system as in Claim 1, wherein the fluid network comprises at least one fluid channel.

Claim 3 (Original): A microfluidic system as in Claim 1, wherein the first segment of the fluid network comprises a plurality of fluid channels operatively connected on both ends to a single fluid channel.

Claim 4 (Currently amended): A microfluidic system as in Claim 1, wherein the electrical source ~~connection means~~ includes a first electrode reservoir and a second electrode reservoir, ~~each~~ operatively connected to a first end and a second end, respectively, of the first segment of the fluid network, wherein the second end of the first segment is fluid coupled to the second segment.

Claim 5 (Currently amended): A microfluidic system as in Claim 4, wherein the second electrode reservoir includes an electrolysis free electrode ~~for the application of electrical signals~~

~~to the system~~ coupled to the coupler to apply electric potential to the first segment without inducing electrolysis in the second electrode reservoir.

Claim 6 (Original): A microfluidic system as in Claim 4, wherein the second electrode reservoir comprises a bubble-free electric connection joint.

Claim 7 (Currently amended): A microfluidic system as in Claim 1, further comprising a ~~selection means for routing~~ valve in fluid communication with the second segment and a plurality of output channels, wherein the valve routes fluid from the ~~fluid network~~ second segment to one of the plurality of output channels ~~external fluid systems~~.

Claim 8 (Currently amended): A microfluidic system as in Claim 1, ~~further comprising means for~~ wherein the second segment comprises an isolation channel preventing contamination of fluids between the first and second segment.

Claim 9 (Currently amended): ~~An electrolysis free electrode comprising~~ A microfluidic system as in Claim 5, wherein the electrolysis free electrode comprises:

a protective housing; and

an ion transferring compound contained in a protective housing, the compound being such that electrons cannot be transferred through it nor can fluids be drawn into it.

Claim 10 (Currently amended): ~~An electrolysis free electrode~~ A microfluidic system as in Claim 9, wherein the protective housing comprises a flexible tubing.

Claim 11 (Currently amended): ~~An electrolysis free electrode~~ A microfluidic system as in Claim 9, wherein the ion transferring compound comprises ~~one of the following compounds: agarose gel with a concentration of greater than 0.5% (w/w), polyacrylamide gel with a concentration of greater than 1% (w/w), or other~~ a polymer gel ~~solutions~~.

Claim 12 (Withdrawn): A bubble-free electric connection joint, comprising:

a substrate;

an access hole defining a first opening and a second opening disposed in the substrate;

an ion exchangeable membrane fixedly connected over the first opening of the access hole such that electrical signals is permitted to pass through the ion exchangeable membrane but fluids are retained by the membrane;

a fluid containing means fixedly connected above the ion exchangeable membrane opposite the first opening of the access hole for containing fluids;

at least one fluid channel defined in the substrate which intersects with the second opening of the access hole such that fluid contained in the fluid channel is in contact with the ion exchangeable membrane

Claim 13 (Withdrawn): A microfluidic system as in Claim 12, wherein the fluid channel intersects with the second opening of the access hole in more than one location such that fluid flows past the access hole while maintaining contact with the ion exchangeable membrane.

Claim 14 (Currently amended): A ~~micropippetor device~~ microfluidic system as in Claim 1, further comprising a pipette discharge~~:~~

~~a microfabricated EOF pump; and~~

~~means for discharging fluid~~.

15. (New): A microfluidic system as in Claim 11, wherein the polymer gel comprises at least one of an agarose gel, a polyacrylamide gel with a concentration, a polyacrylamide gel, sol-gel monoliths, and acrylate polymer monoliths.

16. (New): A microfluidic system as in Claim 11, wherein the polymer gel comprises at least one of an agarose gel with a concentration of greater than 0.5% (w/w), a polyacrylamide gel with a concentration of greater than 1% (w/w), and a polyacrylamide gel with a weight concentration of 2-10%.

17. (New): A microfluidic system as in Claim 5, wherein the electrolysis free electrode comprises an ion exchangeable membrane that allows ion to pass through but not fluid to pass through.